ABSTRACT OF THE DISCLOSURE

A multiple-stage encoder encodes the data in accordance with one, two,..., or f factors of an associated cyclic code generator polynomial $g(x) = g_1(x) * g_2(x) * \ldots * g_f(x)$ to produce data code words that include a selected number of ECC symbols. The encoder encodes the data d(x) in a first stage using a first factor $g_m(x)$ of a selected polynomial $p_s(x)$ to produce $d(x)*x^s = q_1(x)g_1(x) + r_1(x)$, where $q_1(x)$ is a quotient and $r_1(x)$ is a remainder and $g_1(x)$ has degree s. In a next stage the encoder encodes $q_1(x)$ using a next factor $g_m(x)$ of the selected polynomial to produce $q_m(x) = q_1(x)g_m(x) + r_m(x)$ and so forth, until the remainders associated with all of the factors of the selected generator polynomial have been produced. The system then manipulates the remainders to produce a remainder $r_s(x)$ that is associated with the selected polynomial $p_s(x)$, and uses a cyclically shifted version of the remainder $r_s(x)$ as the code word ECC symbols. The same circuitry is used to both produce and manipulate the remainders, and may also be used for decoding the code words in accordance with the selected polynomials.